K130860

APR 2 5 2013

Special 510(k) Summary – Device Modification

Introduction This 510(k) summary is being submitted in accordance with the requirements of 21 CFR 807.92 and the Safe Medical Device Act of 1990.

Submitter

Bio-Rad Laboratories, Inc.
Clinical Systems Division
4000 Alfred Nobel Drive
Hercules, CA 94545

Contact Person

Ebony McKinnies
Regulatory Affairs Representative

Device Names

1) VARIANT™ II Hemoglobin A1c Program, Catalog No.: 270-2101NU
2) VARIANT™ II β-thalassemia Short Program, Catalog Nos.: 270-2103, 270-2154

Classification

1) Glycosylated hemoglobin assay, 21 CFR 864.7470 (LCP)
2) Hemoglobin A2 assay, 21 CFR 864.7400 (JPD)

Predicate Devices

Table 1: Predicate Devices

Device Name	510(k) Number	Product Regulation and Code
VARIANT II Hemoglobin A1c Program	K070452	21 CFR 864.7470 (LCP)
VARIANT II β-thalassemia Short Program	K063643	21 CFR 864.7400 (JPD)

Intended and Indications for Use

Intended Use: VARIANT II Hemoglobin A1c Program

The Bio-Rad VARIANT™ II Hemoglobin A1c Program is intended for the percent determination of hemoglobin A1c in human whole blood using ion-exchange high-performance liquid chromatography (HPLC). The Bio-Rad VARIANT II Hemoglobin A1c Program is intended for Professional Use Only. For in vitro diagnostic use.

Indications for Use: VARIANT II Hemoglobin A1c Program

Measurement of percent hemoglobin A1c is effective in monitoring long-term glucose control in individuals with diabetes mellitus.

Intended Use: VARIANT II β-thalassemia Short Program

The VARIANT™ II β-thalassemia Short Program is intended for the separation and area percent determinations of hemoglobins A2 and F, and as an aid in the identification of abnormal hemoglobins in whole blood using ion-exchange high-

performance liquid chromatography (HPLC). The Bio-Rad VARIANT II β-thalassemia Short Program is intended for use only with the Bio-Rad VARIANT II Hemoglobin Testing System. For in vitro diagnostic use.

Indications for Use: VARIANT II β-thalassemia Short Program

Measurement of the percent hemoglobin A2 and F are effective in screening of β-thalassemia (i.e., hereditary hemolytic anemias characterized by decreased synthesis or more types of abnormal hemoglobin polypeptide chains).

Submission Purpose and History

Submission Purpose

The software updates include customer requested features, whereas both software and firmware include specific defect fixes. When compared to the predicate device, there are no changes to the performance specifications, intended or indications for use, or operating principles. Moreover, Risk Analysis and Verification/Validation testing results demonstrate that the changes do not affect product safety, effectiveness, and substantial equivalency claims.

Notification of previous changes

Utilizing the Risk Management Process, FDA guidance documents and regulations it was determined that the following changes did not warrant a premarket submission:

Table 2: Notification of Previous Modifications

Modification	Description of Modification
CDM 4.02 – 5.1.1	▪ As a result of a field corrective action, Golden Rules was implemented to serve as a preventative tool that detects sampling identification errors and prevents the transmission of errant results to an LIS (v.4.02/4.03) ▪ Added conversion factor between IFCC, JDS, and NGSP that aligned with the existing labeling, international customer and regulatory requirements—Europe and Japan. (v.5.1) ▪ Added Export to PDF and automated priming function to improve ease-of-use and analysis workflows (v.5.1) ▪ Two defect corrections, identified with the Reanalysis feature, were implemented to address customer feedback—1) defect #1 caused CDM to crash when in the Reanalysis Window and 2) defect #2 did not allow calibrator reassignment in Reanalysis because of an unpopulated calibration table (v.5.1.1)
Updated PC Board	Replaced obsolescent PC Board (implemented with CDM v.5.1.1 concurrently)

In addition, these changes were designed, developed and implemented under established design control and GMP processes; there were no changes to the intended/indications for use, performance specifications, or operating principles.

Moreover, documentation to support these changes and processes are stored in the applicable Design History Files; therefore, this Special 510(k) covers the recent firmware and software changes only, as described in the Submission Purpose section.

Description of Instrument

The VARIANT II Hemoglobin Testing System is a fully automated, high-throughput hemoglobin analyzer. The VARIANT II Hemoglobin Testing System provides an integrated method for sample preparation, separation and determination of the relative percent of specific hemoglobin in whole blood. It consists of two modules — the VARIANT II Chromatographic Station (VCS) and the VARIANT II Sampling Station (VSS). In addition, a personal computer is used to control the VARIANT System using Clinical Data Management (CDM) Software.

A personal computer (PC) is used to control the VARIANT II Hemoglobin Testing System using Clinical Data Management (CDM™) software. The CDM software supports import of sample information from and export of patient results to a Laboratory Information System (LIS). Control results are displayed on Levy-Jennings Charts and are exportable to Unity Real Time™.

Table 3: FDA-cleared assays for use on the VARIANT II Hemoglobin Testing System with CDM Software

VARIANT II Assay	Assay Part No.	Component Names and Part Nos.	Explanation of Test
VARIANT II Hemoglobin A1c Program	270-2101NU	The assay contains the following components - ▪ Whole Blood Primer, 270-0350 ▪ Elution Buffer A, 270-2110NU ▪ Elution Buffer B, 270-2111NU ▪ Wash/Diluent Solution, 270-2112NU ▪ Analytical Cartridge, 270-2113NU ▪ CD-ROM, 270-2114NU ▪ Calibrator/Diluent Set, 270-2115NU ▪ Sample Vials, 270-2149	The VARIANT II Hemoglobin A1c Program is a well established method of measuring the level of Hemoglobin A1c in red blood cells. Therapy for diabetes requires the long-term maintenance of a blood glucose level as close as possible to normal levels to minimize the risk of long-term vascular consequences.
VARIANT II β-thalassemia Short Program	270-2103 270-2154	The assay contains the following components – ▪ Elution Buffer 1, 270-0004 ▪ Elution Buffer 2, 270-0005 ▪ HbA2/F Calibrator/Diluent Set, 270-0083 ▪ Analytical Cartridge, 270-0182 ▪ Whole Blood Primer, 270-0351 ▪ Sample Vials, 270-2149 ▪ Wash/Diluent Solution, 270-2164 ▪ CD-ROM, 270-2165	The VARIANT II β-thalassemia Short Program is a well established method of measuring Hemoglobins A2 and F in human red blood cells. A frequently occurring thalassemia, beta-thalassemia (β-thalassemia) is commonly found in the heterozygous state as β-thalassemia minor or β-thalassemia trait.

Comparison to Predicate Device

The following tables delineate the similarities and differences between the predicates and modified devices.

Table 4: VARIANT II Hemoglobin A1c Program

Feature	Predicate: VARIANT II Hemoglobin A1c Program, K070452	Modified device: VARIANT II Hemoglobin A1c Program	
Similarities			
Technology	Ion-exchange high performance liquid chromatography		
Sample type	Anticoagulated whole blood (EDTA)		
Calibrator	Human anticoagulated whole blood treated with EDTA		
Certification	Certified by the NGSP as traceable to the Diabetes Control and Complications Trial (DCCT) Reference method.		
Certification	Certified by the IFCC as traceable to the IFCC Reference Measurement Procedure.		
Instrument Control	Windows Operating System with Proprietary Assay Software		
Kit configuration	Whole Blood Primer (2 each), Elution Buffer A (3 each), Elution Buffer B (1 each), Wash/Diluent Solution (3 each), Analytical Cartridge (1 each), CD-ROM (1 each), Calibrator/Diluent Set (1 each), Sample Vials – package of 100 (1 each)		
Chemistry	Cation Exchange Matrix		
Safety Standards for Electrical Equipment for IVD Use	BS EN 61010 Certified		
Electromagnetic Compatibility	BS EN 61326 Certified		
Intended/Indications for Use	The Bio-Rad VARIANT II Hemoglobin A1c Program is intended for the percent determination of hemoglobin A1c in human whole blood using ion-exchange high-performance liquid chromatography (HPLC). For in vitro diagnostic use. Measurement of percent hemoglobin A1c is effective in monitoring long-term glucose control in individuals with diabetes mellitus.		
Performance Claims	No change or impact, claims transferred from predicate device.		
Differences			
CDM Software	CDM Software version 4.0	CDM Software version 5.2	
VARIANT II Testing System Firmware	EPROM VCS 41.300 VSS 51.381 VSS PUMP 4.50	EPROM VCS 41.301 VSS 51.403 VSS PUMP 4.50	FLASH VCS 42.300 VSS 52.403 VSS PUMP 5.00
Historical Database Review	N/A	Archive Viewer – this tool does not allow transmission to an LIS, and is not intended for repeat reporting.	

Table 5: VARIANT II β-thalassemia Short Program

Feature	Predicate: VARIANT II β-thalassemia Short Program, K063643	Modified device: VARIANT II β-thalassemia Short Program	
Similarities			
Technology	Ion-exchange high performance liquid chromatography		
Sample type	Anticoagulated whole blood (EDTA)		
Calibrator	Human anticoagulated whole blood treated with EDTA		
Instrument Control	Windows Operating System with Proprietary Assay Software		
Kit configuration	250 Tests / 500 Tests: Elution Buffer 1 (2 / 3 each), Elution Buffer 2 (1 / 2 each), HbA2/F Calibrator/Diluent Set (1 / 1 set), Analytical Cartridge (1 / 2 each), Whole Blood Primer (3 / 3 packs), Sample Vials – package of 100 (1 / 1 each), Wash/Diluent Solution (1 / 2 each), CD-ROM (1 / 1 each)		
Chemistry	Cation Exchange Matrix		
Safety Standards for Electrical Equipment for IVD Use	BS EN 61010 Certified		
Electromagnetic Compatibility	BS EN 61326 Certified		
Intended Use	The VARIANT™ II β-thalassemia Short Program is intended for the separation and area percent determinations of hemoglobins A2 and F, and as an aid in the identification of abnormal hemoglobins in whole blood using ion-exchange high-performance liquid chromatography (HPLC). The Bio-Rad VARIANT II β-thalassemia Short Program is intended for use only with the Bio-Rad VARIANT II Hemoglobin Testing System. For in vitro diagnostic use.		
Performance Claims	No change or impact, claims transferred from predicate device.		
Differences			
CDM Software	CDM Software version 4.0	CDM Software version 5.2	
VARIANT II Testing System Firmware	EPROM VCS 41.300 VSS 51.381 VSS PUMP 4.50	EPROM VCS 41.301 VSS 51.403 VSS PUMP 4.50	FLASH VCS 42.300 VSS 52.403 VSS PUMP 5.00
Historical Database Review	N/A	Archive Viewer—this tool does not allow transmission to an LIS, and is not intended for repeat reporting.	

Risk Management Process for Device Modifications

In accordance with ISO 14971, and internal risk management processes and procedures a defined risk analysis was used to identify, mitigate, or eliminate potential risks associated with the device modifications. For each identified risk, a Failure Mode and Effects Analysis (FMEA) was conducted. This was performed in a systematic manner by a trained risk assessment team until consensus was reached that an adequate analysis had been performed. The risk evaluation for the device software and firmware modifications included the following tasks:

- Reviewed modifications and design inputs to identify potential risks and hazards;

- Reviewed existing product risk tables and customer complaints to identify potential risks and hazards;
- Considered requirements of IEC 62304, Software Design and Development processes and plan to identify potential risks and hazards;
- Identified and implemented risk mitigations and hazard controls through software, hardware, and labeling for misuse and use scenarios;
- Updated existing FMEA and Hazard Analysis tables with newly identified risks, software defects, residual risks, mitigations and hazard controls;
- Evaluated modified product using established verification and validation processes, plans and protocols with appropriate acceptance criteria that determined whether risk mitigations, hazard controls, and residual risks were as safe and effective as the predicate device;
- Conducted a comprehensive risk management review and wrote a Risk Management Report that summarized all risk activities and deemed the modified product safe, effective, and comparable to the predicate device.

Design verification/validation tests met established acceptance criteria.

Conclusion

When considering the similarities of the intended use, the general features and characteristics of the assay, and the use of the same technology, it can be concluded that the VARIANT II Hemoglobin A1c Program and VARIANT II β-thalassemia Short Program are substantially equivalent to the cleared and currently marketed predicate devices.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
10903 New Hampshire Avenue
Document Control Center – WO66-G609
Silver Spring, MD 20993-0002

Bio-Rad Laboratories, Inc.
C/O Ebony McKinnies
4000 Alfred Nobel Drive
HERCULES CA 94545

April 25, 2013

Re: K130860
Trade/Device Name: VARIANT™ II Hemoglobin A1c Program
VARIANT™ II ™ ß-thalassemia Short Program
Regulation Number: 21 CFR 864.7470
Regulation Name: Glycosylated hemoglobin assay
Regulatory Class: II
Product Code: LCP, JPD
Dated: March 21, 2013
Received: March 28, 2013

Dear Ms. McKinnies:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Part 801); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820); and if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801), please go to http://www.fda.gov/AboutFDA/CentersOffices/CDRH/CDRHOffices/ucm115809.htm for the Center for Devices and Radiological Health's (CDRH's) Office of Compliance. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm.

Sincerely yours,

Denise Johnson-Iyles -S for

Courtney H. Lias, Ph.D.
Director
Division of Chemistry and Toxicology Devices
Office of In Vitro Diagnostics
and Radiological Health
Center for Devices and Radiological Health

Enclosure

Indications for Use Form

510(k) Number (if known): k130860

Device Name: VARIANT™ II Hemoglobin A1c Program /VARIANT™ II β-thalassemia Short Program

Indications for Use:

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Measurement of percent hemoglobin A1c is effective in monitoring long-term glucose control in individuals with diabetes mellitus.

Prescription Use X AND/OR Over-The-Counter Use
(Part 21 CFR 801 Subpart D) (21 CFR 801 Subpart C)

(PLEASE DO NOT WRITE BELOW THIS LINE-CONTINUE ON ANOTHER PAGE OF NEEDED)

Concurrence of CDRH, Office of In Vitro Diagnostics and Radiologic Health (OIR)

Katherine Serrano

Division Sign-Off
Office of In Vitro Diagnostics and Radiologic Health

510(k) k130860

Indications for Use Form

510(k) Number (if known): k130860

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Measurement of the percent hemoglobin A2 and F are effective in screening of β-thalassemia (i.e., hereditary hemolytic anemias characterized by decreased synthesis or more types of abnormal hemoglobin polypeptide chains)

Prescription Use X AND/OR Over-The-Counter Use _____
(Part 21 CFR 801 Subpart D) (21 CFR 801 Subpart C)

(PLEASE DO NOT WRITE BELOW THIS LINE-CONTINUE ON ANOTHER PAGE OF NEEDED)

Concurrence of CDRH, Office of In Vitro Diagnostics and Radiologic Health (OIR)

Katherine Serrano

Division Sign-Off
Office of In Vitro Diagnostics and Radiologic Health

510(k) k130860